
A Profile of Homicides on the Streets and in the Homes of New York City

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Synopsis

Although prior research has found that homes containing firearms and illicit drug and ethanol users

are more likely to be the scene of a homicide than homes that do not contain these elements, the authors studied homicides on the streets as well as in homes so as to assess the role of firearms, cocaine, and ethanol in both settings.

Using the files of the Chief Medical Examiner, the authors reviewed all 4,468 homicides occurring in New York City in 1990 and 1991. The most frequent places of occurrence were the streets and other outdoor places (49.6 percent) and the victims' homes (19.3 percent). Firearms were the cause of death for 49.6 percent of homicides in the home and 80.3 percent of those on the streets. Use of cocaine and ethanol was found more frequently among victims killed on the streets than those killed at home. In addition, victims killed on the streets were more likely to be male, ages 15–24 years, and African American.

Further research in regard to prevention and intervention strategies is needed, keeping in mind the different patterns of homicide on the streets compared with those occurring in other settings.

VIOLENCE IS ONE OF THE MOST important public health problems in the United States today. Appropriately, the medical profession has become increasingly vocal concerning the need for action. Although it is acknowledged that homicides are caused by a complex set of factors, attention has focused on the control of firearms as a way to prevent the rising toll of death (1–4). Disputes between persons who are family members or intimates are 23 times more likely to result in death if a firearm is present at the scene (5).

Use of drugs or ethanol, or both, is another factor associated with increased risk of assault and homicide. Roughly two-thirds of killers or victims are drinking at the time of the homicide. In addition, one-fourth of homicide victims tested positive for other drugs (6). Illicit drugs such as cocaine have been found to be associated with violence both in terms of perpetrators and victims (7–10).

The home has been the focus of research on the role of firearms and drug use in homicides. House-

holds where homicides occurred are more likely than control households in the same neighborhood to have a firearm, an illicit drug user, a drinker, a person with prior arrests, and someone who had been hurt in the past in a fight in the home (11).

Many homicides occur outside the home, of course. In this study, we have broadened the scope of research to determine how homicides that occur in public, that is, on the street and other open places, differ from those that occur in the homes of victims in terms of demographic characteristics of the victims as well as the role of firearms and the victim's use of ethanol or cocaine at the time of the event.

Methods

In this study we used data collected from the files of the Chief Medical Examiner of New York City who is responsible for the certification of all unnatural deaths in the five boroughs of the city. All deaths occurring in the calendar years 1990 and 1991

Table 1. Demographic characteristics of all homicide victims in New York City, 1990–91

Characteristics	Number	Percent
Sex:		
Male.....	3,842	86.0
Female.....	624	14.0
Unknown.....	2	0.0
Age group (years)		
Younger than 15.....	140	3.1
15–24.....	1,492	33.4
25–34.....	1,520	34.0
35–54.....	1,025	23.0
55 and older.....	271	6.0
Unknown.....	20	0.4
Race-ethnic group:		
White.....	446	10.0
African American.....	2,121	47.5
Latino.....	1,708	38.2
Asian, other.....	185	4.1
Unknown.....	8	0.2
Totals.....	4,468	100.0

and certified as homicides (ICD-9 E960-E975) by the Medical Examiner were eligible for the study. Demographic data, time and location of injury and death, cause of death, and toxicologic findings were manually abstracted from the files.

A research assistant classified the location of the homicide as the victim's residence; other person's residence; victim's workplace; other nonresidential buildings (store, hotel, bar or restaurant, and other buildings); car; public transit; street; and outdoor places other than streets (parks, roofs, and parking or vacant lots) based on the reports of field investigations by medical examiners and police. The race-ethnicity of the homicide victims was classified on the basis of information supplied by the family or other persons identifying the body, not merely by the last name or the victim's skin color.

Some victims may have survived after injury long enough to eliminate cocaine, ethanol, and benzoylecgonine, an inactive metabolite of cocaine, from their bodies. In these cases, a negative result of toxicology tests would not reflect the use of cocaine or ethanol at the time of injury. Thus we took survival time into consideration. Survival time, defined as the period from injury to death, was calculated and rounded to the nearest hour for each case. A survival time of 2 hours was used as a cutoff because prior use of significant amounts of cocaine or ethanol would be detected in that interval (12–14).

We chose a conservative cutoff time so we could include as many victims as possible who were under the influence of cocaine or ethanol but exclude those who had taken cocaine or ethanol a number of hours prior to the homicide. Cases exceeding the cutoff

were not included in the chi-square analyses of toxicology findings for cocaine, ethanol, and benzoylecgonine for those killed on the streets compared with those killed in the home setting.

Blood and urine samples were obtained at autopsy and stored at 4°C until assay. Benzoylecgonine was screened in urine samples using a homogeneous enzyme immunoassay and was considered positive if the concentration was equal to or greater than 0.3 milligrams per liter (mg per L). Positive results from urine samples were substantiated in tests of blood samples for cocaine and metabolites by radioimmunoassay. In some cases, urine was unavailable at autopsy. In such instances, blood was screened by radioimmunoassay as described heretofore and was considered positive for cocaine if the concentration was equal or greater than 0.1 mg per L.

In addition, all blood samples considered positive by radioimmunoassay were analyzed by gas chromatography for cocaine and benzoylecgonine. Ethanol analysis was performed by head space gas chromatography using a flame ionization detector. Initial screening was done on blood, and a specimen was considered positive if the concentration was equal to or greater than 0.01 gram percent. Analysis of ethanol in the brain was done for cases that were positive in blood using the same method.

Two-tailed chi-square tests ($\alpha = .05$) were used to compare victims killed at home with those killed on the streets in regard to their demographic characteristics, cause of death, and use of ethanol and cocaine at the time of injury as well as to compare the demographic compositions of the samples that were included and excluded from the analyses of toxicology. Chi-square analyses were used also to compare victims killed at home with those killed on streets in regard to the presence of cocaine, benzoylecgonine, and ethanol in toxicology tests.

Results

There were 4,468 homicides in New York City in 1990 and 1991. The characteristics of the victims and homicides are presented in table 1—86 percent of homicide victims were males, 67 percent were ages 15–34 years, 86 percent were either African American or Latino. The population of New York City is more than 7 million, with 43 percent white, 25 percent African American, 24 percent Latino, and 8 percent other racial groups. Thirty-three percent are between ages 15 and 34 years (15). Thus, it is apparent that homicide victims were disproportionately more likely to be male, young, and African American or Latino.

The sites of homicides are presented in table 2. The most frequent places where fatal injuries occurred were streets (2,036 or 45.6 percent of homicides) and victims' homes (861 or 19.3 percent of homicides). In subsequent analyses, we included the 200 homicides occurring in parks, open lots, and on public transit in the street category. An additional 1,271 homicides that occurred in other places were not included in subsequent analyses. These included 315 (7.0 percent) in residences other than the victims' homes, 425 (9.5 percent) in nonresidential buildings, 258 (5.8 percent) in automobiles, and 175 (3.9 percent) in a workplace, usually that of the victim.

A comparison of the 861 homicides in the home with the 2,236 on streets and other open places is presented in table 3. Women comprised a greater proportion of homicides at home than on the street whereas victims killed on the streets were almost all men ($\chi^2 = 350.54$, $df = 1$, $P < .0001$). More than three-fourths of street homicide victims were between ages 15 and 34 years, whereas homicides at home had a disproportionate number of victims younger than age 15 years or ages 35 years and older ($\chi^2 = 444.44$, $df = 4$, $P < .0001$). There was a modest racial difference with whites comprising a greater proportion of victims murdered at home than on streets and African Americans a greater proportion on the street ($\chi^2 = 34.76$, $df = 3$, $P < .0001$). Firearms constituted a greater proportion of street homicides, whereas cutting, beating, strangulation, fires, and other nonfirearm causes constituted greater proportions of home homicides ($\chi^2 = 361.82$, $df = 5$, $P < .001$).

To assure assessment of toxicological evidence that takes account of the time required to eliminate ethanol and cocaine from the body, 332 victims (10.7 percent) who died more than 2 hours after injury were excluded from the following analysis. Victims excluded were more likely than those included to be female ($\chi^2 = 51.51$, $df = 1$, $P < .001$), white ($\chi^2 = 46.80$, $df = 4$, $P < .001$), and younger or older than ages 15–34 years ($\chi^2 = 125.48$, $df = 8$, $P < .001$). Victims included in the analysis were more likely to be positive for ethanol ($\chi^2 = 45.36$, $df = 1$, $P < .001$). There was no statistically significant difference between those included and excluded in regard to being positive for cocaine or benzoyllecgonine.

As shown in table 4, victims killed on the streets were more likely than those killed at home to have positive toxicological results for cocaine (19.0 percent versus 15.8 percent), ethanol (21.4 percent versus 16.0 percent) and the combination of cocaine and ethanol (15.2 percent versus 12.8 percent). Street homicide victims were positive for cocaine in 34.2

Table 2. Sites of all homicides in New York City, 1990-91

Site	Number	Percent
Street.....	2,036	45.6
Other outdoor places (park, open lot, public transit)	200	4.5
Victim's home	861	19.3
Other residence	315	7.0
Nonresidential building.....	425	9.5
Automobiles.....	258	5.8
Workplace.....	175	3.9
Other and unknown	198	4.4
Totals.....	4,468	100.0

percent of cases compared with 28.6 percent of victims in homicide taking place at home ($\chi^2 = 16.78$, $df = 3$, $P < .0008$).

Discussion

In this study we have found that the street and other open places, at least in this large metropolitan setting, is the place where almost half of homicides occur. Certain types of victims are killed on the street rather than in their homes. Persons killed on the street were more likely to be male, ages 15–34 years, African American, to have used cocaine or ethanol, or both, at the time of injury, and to be killed with a firearm.

Our finding that victims killed on the street were more likely than those killed at home to be under the influence of cocaine at the time of the murder is not surprising, since obtaining cocaine necessitates contact with the illegal drug culture that contains elements of violence. In drug dealing, violence is used to gain access to markets, to obtain money, to retaliate against other competitors, and to settle disputes (16–18).

We did not expect to find a difference between victims killed on the street and those killed at home in regard to ethanol, but we did. It appears that drinking as well as use of cocaine is associated with violence taking place on the streets, parks, and other open public places in the city. We know that in domestic disputes, often taking place at home, ethanol is associated with homicide (6). Further study of the circumstances of homicides on the streets is planned to determine why ethanol is even more frequent in these events than in homicides occurring in homes.

The demographic differences in killings at home or on the street fall into the "routine activities" category of homicides. The very young and older victims are more likely to be killed at home than on the streets because they spend more time at home. Males ages 15–24 years in general spend more time

Table 3. Comparison of homicides in victims' homes with those on the streets of New York City, 1990-91

Characteristic	Home		Street		Statistics
	Number	Percent	Number	Percent	
Sex:					
Male	577	67.0	2,083	93.2	} $\chi^2 = 350.54, df = 1, P < .0001$
Female	284	33.0	153	35.0	
Age group (years):					
Younger than 15	92	10.7	24	1.1	} $\chi^2 = 444.44, df = 4, P < .0001$
15-24	150	17.4	907	40.6	
25-34	233	27.1	797	35.7	
35-54	247	28.7	435	19.5	
55 and older	139	16.1	70	3.1	
Race, ethnic group:					
White	121	14.1	169	7.6	} $\chi^2 = 34.76, df = 3, P < .0001$
African American	397	46.1	1,189	53.2	
Latino	315	36.6	816	36.5	
Asian, other	28	3.3	60	2.2	
Cause of death:					
Shooting	427	49.6	1,796	80.3	} $\chi^2 = 361.82, df = 5, P < .0001$
Cutting	208	24.2	278	12.4	
Beating	102	11.8	116	5.2	
Strangling	69	8.0	19	0.8	
Fires, burns	23	2.7	2	0.1	
Other	32	3.7	25	1.1	

Table 4. Comparing the presence of cocaine or ethanol, or both, in homicide victims killed at home with those killed on the streets, New York City, 1990-91¹

Toxicology results	Home		Street		Statistics
	Number	Percent	Number	Percent	
Cocaine	69	15.8	278	19.0	} $\chi^2 = 16.78, df = 3, P = .0008$
Ethanol	70	16.0	313	21.4	
Cocaine and ethanol	56	12.8	223	15.2	
No cocaine or ethanol	243	55.5	652	44.5	

¹Victims dying longer than two hours after injury are excluded from this analysis.

on the streets than other groups (19). In addition, our finding that young males are killed on the street and have recently used cocaine may reflect, in part, those who live on the street, get involved in drug dealing, and use drugs (20). The presence of young males on the streets of cities has been linked to disorganization of communities, deterioration of families, lack of supervision, lack of social control, and crime (21,22). These social conditions are often linked to poverty and other indicators of low socioeconomic status and not to race per se (23).

In the 1990s, the "new homicide" differs from the classic homicide of earlier years that involved family members and friends killing each other in domestic disputes, often at home (6,24). Beginning around 1985 in the United States, the proportion of males ages 18 years or younger, particularly African Americans, has increased dramatically both in terms of being perpetrators as well as victims of homicide

(25). The new homicide involves young males spending most of their time on the streets in urban ghettos, armed with semiautomatic weapons. They kill each other because of minor disputes in which they feel disrespected, because of gang affiliations, or over drug-dealing. Sometimes strangers are killed accidentally or purposely during robberies.

Our finding that 50 percent of homicides in the home were the result of shootings concurs with a previous study that showed that guns kept in the home increase the risk of homicide by a family member or acquaintance rather than confer protection from intruders (11). Our study demonstrates that firearms are even more problematic in attacks on the streets and other open public places.

The United States is an armed nation. The number of firearms in the country was estimated to be about 200 million in 1990 (26). In a survey in Seattle, 34 percent of high school students reported easy access

to a firearm, and 6 percent reported owning a gun (27). One-third of those owning a gun reported firing it at someone. A survey in Washington, DC, found that 25 percent of male junior high school students reported carrying a gun, and those who did more often had a history of violence and arrests than those who did not carry guns (28). The street is a dangerous place in some parts of our cities with innocent bystanders being killed by drug dealers, gang members, and other criminals (29). Homicide is a major public health problem, and the availability of firearms is part of that problem.

Research is needed to delineate further how substance abuse and firearms operate to increase the risk of homicide and how various intervention strategies should be formulated. Different strategies have to be applied to address homicides on the streets versus those in homes. Strategies could include different styles of law enforcement, community organization, drug treatment, vocational and recreational programs, and education of young children regarding drug abuse. Cost-benefit analyses of demonstration projects are in order before any particular prevention strategy is widely implemented.

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